

Exserohilum Leaf Spot on Bromeliads¹

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INTRODUCTION: Many species of bromeliads are grown and cultivated for their spectacular flowers and foliage. Bromeliads are used in landscape schemes in tropical climates, as focal points of indoor landscapes, in dish gardens or as specimen plants. Some of the more commonly grown species of bromeliads belong to the genera, *Aechmea* Ruiz & Pav., *Guzmania* Ruiz & Pav., *Neoregelia* L. B. Sm., *Tillandsia* L., and *Vriesea* Lindl..

Commercially produced bromeliads are often grown in containers using a well-drained organic potting medium. However, the vast majority of bromeliads, including the cultivated ones, are considered “air plants” or epiphytes. In nature, epiphytic bromeliads attach themselves by their roots to the trunks and branches of trees, using this “scaffolding” solely for support. Bromeliads do not impact their supporting plants adversely. Other bromeliads, like the pineapple (*Ananas comosus* (L.) Merr.), retrieve their essential nutrients from the soil medium in which they have taken root. Bromeliads can be found in widely different environments. Some varieties are adapted to dry, desert-like climates while others are suited to shaded tropical locations. Tropical species typically have foliage arranged into vase-shaped cups which hold water (and minerals) in the center portion of the plant. Those adapted to desert conditions lack water-filled cups, but conserve moisture and absorb minerals by way of thousands of specialized leaf scales which often appear as a silvery or powdery substance on the leaves. Tropical, shade-adapted bromeliads also tend to have softer more colorful foliage than xerophytic types (Everett 1981).

PATHOGEN: In their natural setting, bromeliads are relatively pest- and pathogen-free; however, as intensively cultivated ornamentals grown *en masse*, a few serious diseases can erupt. Particularly devastating are foliar spots and blights caused by *Exserohilum* spp.

The genus *Exserohilum* is so named because conidia produced by these fungi bear a conspicuous protruding hilum located at their base. The hilum constitutes the attachment point between the conidium (asexual spore) and the conidiophore from which the spore is produced. Conidia of *Exserohilum* spp. are cylindrical, generally tapered toward the apex, pigmented olivaceous-brown and are multi-distoseptate (Sivanesan 1987).

Exserohilum rostratum (Drechsler) Leonard & Suggs is the most common species listed in current Florida and USDA disease indices; however, another species of *Exserohilum* has become a prominent pathogen of certain bromeliads (Alfieri *et al.* 1993; Farr *et al.* 1989). During the late summer of 1997 and continuing through early to mid-spring of 1998, bromeliad species of the genera *Guzmania*, *Neoregelia*, and *Aechmea* were collected from three Central Florida nurseries and sent to the Division of Plant Industry in Gainesville, Florida, for diagnosis of a severe leaf-spotting problem. Examination of the symptomatic leaves and subsequent isolation in culture revealed consistently and exclusively a species of *Exserohilum* unlike *E. rostratum*. Several morphological differences exist between these two species. The most obvious difference is the lack of a dark, thickened, basal septum in conidia of the unspeciated *Exserohilum*. Also, the apical portion of *E. rostratum* conidia tend to elongate into a long rostrate beak, whereas the beak is much less developed in the new bromeliad isolate (Sivanesan 1987) (Fig. 1). This *Exserohilum* sp., when sporulating on a bromeliad host or on acidified potato dextrose agar exhibits irregularly shaped conidia, many of which are significantly curved or bent. A rostrate apex may or may not be present (Fig. 2). Oddly, this species develops much less curved and more rostrate conidia when grown on peanut stem/water agar, however, these spores remain uncharacteristic of those typically produced by *E. rostratum* (Fig. 3).

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Fig. 1. Typical conidia of *Exserohilum rostratum* (pictured on St. Augustine turfgrass) exhibiting dark, thickened basal septa and rostrate apices. Photography credit: Robert M. Leahy.

CONTROL: Control of *Exserohilum* leaf spot is dependent on both cultural and chemical means. Vigilant observation of the bromeliad crop is necessary to ensure that infected plants are rogued as soon as possible. Watering should be reduced and applied so as to insure that the foliage will dry quickly. Overhead irrigation and associated water splash can dislodge conidia from infected plants and spread inoculum to neighboring bromeliads. A prolonged period of moisture on susceptible foliage provides an excellent environment for *Exserohilum* spp. to infect and cause disease (Chase 1997). Successful management of this disease may require that cultural methods be used in tandem with the appropriate fungicides. According to the 1998 Florida Plant Disease Management Guide (University of Florida - IFAS), three fungicides with broad crop clearances for ornamentals may provide effective control of *Exserohilum* leaf spot. Mancozeb-containing products (Dithane T/O 75DF®, 37WF®, Fore 37F®, 80WP®, WSB®) have been shown to control *Exserohilum*; however, they have no residual systemic activity which could be important if disease incidence is high. Iprodione (Chipco 26019 50WP®) is locally systemic at the contact site and triflumizole (Terraguard 50W®) has systemic activity throughout the treated plant (Simone *et al.* 1998). **READ FUNGICIDE LABELS CAREFULLY AND USE ONLY IN ACCORDANCE WITH LABEL DIRECTIONS.**

SYMPTOMS: *Exserohilum* leaf spots are first observed as small, circular, translucent or water-soaked areas which rapidly develop into elongated dark brown necrotic streaks (Fig. 4). These streaks expand and may coalesce, eventually blighting infected foliage (Chase 1997). Spores produced in leaf lesions have a tendency to wash into the centrally located, vase-shaped cup where extensive spotting can occur. Severe infections in this area usually lead to terminal decline of the bromeliad host. When *Exserohilum* is actively sporulating, it appears as a grayish-black fuzz on the surface of the leaf lesions. With the aid of a dissecting microscope or a good magnifying glass, individual cigar-shaped conidia may be observed within necrotic leaf spots and scattered about on the surrounding leaf surface.



Fig. 2. Irregularly shaped and curved conidia of *Exserohilum* sp. from bromeliads grown on acidified potato dextrose agar. Photography credit: Robert M. Leahy.



Fig. 3. *Exserohilum* sp. from bromeliad showing less curved conidia with rostrate apices grown on peanut stem/ water agar. Notice that the basal septa are not dark or thickened. Photography credit: Robert M. Leahy.



Fig. 4. Typical symptoms of *Exserohilum* leaf spot on *Neoregalia* sp. Photography credit: Robert M. Leahy.

SURVEY AND DETECTION: Bromeliads infected with *Exserohilum* leaf spot exhibit oval to diamond-shaped elongated leaf spots. These lesions become dark brown, but begin as circular translucent spots and may have a thin chlorotic border. Sporulation of *Exserohilum* spp. may be observed as grayish-black velvety growth on the surface of leaf lesions. The use of a hand lens may reveal individual, darkly pigmented, cylindrical spores on and around infected tissue.

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